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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/579,781

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Etsuo Kawate

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EXAMINER

LAPAGE, MICHAEL P

ART UNIT

PAPER NUMBER

2886

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/579,781	<b>Applicant(s)</b> KAWATE, ETSUO	
	<b>Examiner</b> MICHAEL LAPAGE	<b>Art Unit</b> 2886	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 December 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. Claims 1-12 are presented for examination.

#### *Specification*

2. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

3. The abstract of the disclosure is objected to because it is a direct copy of claim 1, and not a concise statement of the technical disclosure of the patent. Correction is required. See MPEP § 608.01(b).

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

***Claim Objections***

4. Claims 1-3, 6-10 recites the limitation "the sample" in multiple lines throughout. There is insufficient antecedent basis for this limitation in the claim. It is believed that to fix the antecedent basis issue "the sample" could be replaced with --the thin film sample--.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-3, 6-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (NPL document Time-domain dielectric constant measurement of thin film in GHz-THz frequency range near the Brewster angle) in view of Aspnes (U.S. Patent No. 3,985,447).**

As to claims 1 and 6, Li discloses and shows in figure 2, a method for measuring a complex dielectric constant, comprising:

a light irradiating unit (i.e. Emitter) that irradiates a sample with light at a first angle (page 2114, left column, lines 5-8);

a measuring unit (i.e. Sensor) that measures light that has transmitted through or reflected on the sample (page 2114, left column, lines 8-14); and

a determining unit (i.e. though Li does not explicitly disclose a determining unit, but inherently in order to follow through and do any calculations a determining unit (i.e.

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human or computer) is required in order to calculate the dielectric constant as done in Li) that determines a complex dielectric constant (i.e. where the FLARE film is being interpreted as a complex layer) of the sample depending upon a spectrum (i.e. where the FIR spectrum range is used in order to determine the dielectric constant) of the transmitted or reflected light (page 2115, left column line 13 to right column line 3).

Li does not explicitly disclose where the light undergoes multiple internal reflections within the sample, and measuring said multiple reflections in order to determine a complex dielectric constant.

However, Aspnes does disclose and show in Figure 1 and in (col. 2, lines 23-27; col. 5, lines 37 thru col. 6, line 4) where the dielectric constant is being measured in order to calculate thin film thickness and the refractive index of the thin film sample.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Li by providing the light have multiple internal reflections within the sample in order to provide the advantage of increased accuracy through the more parameters present when allowing the light to reflect multiple times within the sample.

The subject matter of claim 1 relates to a method whose technical features are in each case suitable for implementing the structure of the apparatus claim 6, therefore the method is also obvious in view of the above rejection.

As to claim 2, Li discloses a method, wherein a complex dielectric constant of the sample is determined by setting an incident angle of the incident light upon the sample

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at 60 degrees or greater and smaller than 90 degrees (page 2114, left column, lines 5-8).

As to claims 3 and 10, Li discloses a method, wherein the sample is a substrate having a uniform dielectric constant and uniform thickness or a sample having a thin film provided on a part of the substrate (page 2114, right column, lines 1-3; where the spin coated film will inherently form a thin film layer on the Si wafer).

As to claims 5, 11 and 12, a method, wherein the irradiation light has a wavelength in a region of a millimeter wave, a sub-millimeter wave or tera-hertz of light (page 2113, left column, lines 25-27; page 2114, left column, lines 3-10) .

As to claim 7, Li disclose in (page 2114, left column, lines 14-16) where an apparatus, wherein incident light upon the sample is changeable in the position (where as the sample is rotated the light incident upon it is in a different position),

Li does not explicitly disclose where a photodetector for receiving the transmitted or reflected light is also changeable in the position.

However, Li does disclose in (page 2114, left column, lines 14-16) where the setup is mounted on a rotatable stage. One of ordinary skill in the art at the time the invention was made would recognize that if the setup was moved the detector being part of the setup would additionally be moving.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Li with a moveable detector in order to provide the advantage of a more versatile system that can efficiently detect reflections by

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compensating for different reflection angles propagating outward from the sample at different angles.

As to claim 8, Li discloses an apparatus, wherein incident light upon the sample is changeable in incident angle (page 2114, left column, lines 5-8 and lines 19-22, where the angles as disclosed were changed between 72 and 73).

As to claim 9, Li discloses and shows in figure 3, where incident light upon the sample is changeable in incidence angle (As explicitly shown in figure 3, the change in phase with respect to the change in incidence angle).

**7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. in view of Aspnes further in view of Salamon et al (U.S. Patent No. 5,991,448)**

As to claim 4, Li in view of Aspnes does disclose where the irradiation light is p-polarized light (page 2114, left column, lines 8-10).

Li in view of Aspnes does not explicitly disclose where the irradiation light is s-polarized light.

However, Salamon does disclose in (col. 7, lines 23-35, and lines 43-52; col. 8, lines 8-12) where the light used to measure complex dielectric constants can be either s or p polarized light.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Li in view of Aspnes by using S-polarized light in order to provide a more versatile device than can measure a larger variety of thin film sample layers.

***Response to Arguments***

8. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL LAPAGE whose telephone number is (571)270-3833. The examiner can normally be reached on Monday Through Friday 7:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury can be reached on 571-272-2287. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael LaPage/  
Examiner, Art Unit 2886

/TARIFUR R CHOWDHURY/

Supervisory Patent Examiner, Art Unit 2886